

The opinion in support of the decision being entered today is  
*not* binding precedent of the Board.

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* JAN L. CLATTY

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Appeal 2007-2597  
Application 09/876,778  
Technology Center 1700

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Decided: August 31, 2007

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Before TERRY J. OWENS, PETER F. KRATZ, and  
CATHERINE Q. TIMM, *Administrative Patent Judges*.

TIMM, *Administrative Patent Judge*.

DECISION ON APPEAL

For the second time (*see* Decision of September 30, 2004), the Appellant appeals under 35 U.S.C. § 134(a) from the Examiner's decision rejecting claims 1-7. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM.

## I. BACKGROUND

The claims are the same as those reviewed pursuant to the previous appeal (*see* previous Decision). We again reproduce claim 1 as illustrative of the subject matter on appeal:

1. An isocyanate-reactive component useful for the production of a rigid closed cell polyurethane foam by a RIM process comprising:
  - a) from 0.5 to 30% by weight, based on total weight of isocyanate-reactive component, of a polyol based on vegetable oil, fish oil or oil derived from animal fat,
  - b) from 5 to 80% by weight, based on total weight of isocyanate-reactive component, of an isocyanate-reactive material which is different from a) having a functionality of at least 1 and a number average molecular weight of from 400 to 10,000,
  - c) a chain extender or a crosslinking agent,
  - d) a blowing agent, and
  - e) a catalyst.

The Examiner relies upon the same prior art as in the previous appeal:

Kurth

US 6,180,686 B1

Jan. 30, 2001

The Examiner again rejects claims 1-7 under 35 U.S.C. § 103(a) as being unpatentable over Kurth.

## II. DISCUSSION

Claims 1 and 7, the two independent claims, each require the replacement of some, but not all, of a conventional isocyanate-reactive material (conventional petroleum-based polyols) with bio-based polyols, such as vegetable-oil-based polyols.

In the prior Decision of September 30, 2004, we determined that Appellant had not shown an error in the Examiner's rejection, nor overcome the rejection with a showing of secondary considerations such as unexpected results. As we explained, while Kurth describes replacing in toto the conventional petroleum-based polyols (the polyols of claim 1, part b)) with vegetable-oil-based polyols (polyols within the genus of claim 1, part a)), one of ordinary skill in the art would have understood that the two forms of polyols were usable together and would have routinely experimented to find workable or optimal concentrations for a useful mixture of the two (Decision 3-5). One of ordinary skill in the art would have expected the blends to have comparable properties to non-blends because Kurth states that "[t]he qualities of the final flexible or semi-rigid urethane foam produced using the vegetable oil are consistent with those produced using a high grade, expensive [petroleum-based] polyol." (Kurth, col. 4, ll. 17-20; *see also* Decision 5). We explained that in such a situation the burden is on the applicant to establish non-obviousness through a showing of secondary considerations such as unexpected results (Decision 5).

Appellant has now introduced into evidence the Clatty Declaration which presents experimental data intended to demonstrate that the claimed isocyanate-reactive component blend is "significantly different from the developments disclosed in WO 00/23491 and [Kurth]." <sup>1</sup> (Declaration ¶ 4 at p. 2).

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<sup>1</sup> The Examiner withdrew an anticipation rejection over WO 00/23491 prior to the Decision of September 30, 2004 "in light of factual demonstration that the reference lacks an isocyanate-reactive component based on the natural oils as claimed." (Answer 3). We consider the Declaration solely in terms

The Examiner contends that the showing of results is not commensurate in scope with the claims which the evidence is offered to support. (Answer 7).

Appellant contends that the showing is adequate because they have made a comparison to the soy-based polyols of Kurth, the closest prior art.

The issue on appeal arising from the contentions of the Appellant and the Examiner is: Does the Clatty Declaration establish that the genus of isocyanate-reactive components encompassed by the claims provide a different result than the formulations disclosed by Kurth, and further has Appellant demonstrated that the results would have been unexpected to those of ordinary skill in the art?

“The combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *KSR Int’l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1739, 82 USPQ2d 1385, 1395 (2007). On the other hand, a showing that the claimed invention exhibits some superior property or advantage that a person of ordinary skill in the relevant art would find surprising or unexpected tends to show that the invention of the claims is not obvious. *See KSR*, 127 S. Ct. at 1739-40, 82 USPQ2d at 1395-96 (The question to be asked is “whether the improvement is more than the predictable use of prior art elements according to their established functions.”). Therefore, Appellant may rebut a prima facie case of obviousness by showing that the claimed invention possesses a property unexpected by those of ordinary skill in the art. *See In re Mayne*,

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of its probative value on the question of obviousness over Kurth, the reference of the currently maintained rejection under 35 U.S.C. § 103(a).

104 F.3d 1339, 1343, 41 USPQ2d 1451, 1455 (Fed. Cir. 1997) ((*quoting In re Soni*, 54 F.3d 746, 750, 34 USPQ2d 1684, 1687 (Fed. Cir. 1995) (“The basic principle behind this rule is straight forward -- that which would have been surprising to a person of ordinary skill in a particular art would not have been obvious. The principle applies most often to the less predictable fields, such as chemistry, where minor changes in a product or process may yield substantially different results.”))).

“In order for a showing of ‘unexpected results’ to be probative evidence of non-obviousness, it falls upon the applicant to at least establish: (1) that there actually is a difference between the results obtained through the claimed invention and those of the prior art, . . . and (2) that the difference actually obtained would not have been expected by one skilled in the art at the time of invention.” *In re Freeman*, 474 F.2d 1318, 1324, 177 USPQ 139, 143 (CCPA 1973) (citations omitted).

To assure that the “difference” shown is probative in nature, our reviewing court has set forth two requirements: (1) The requirement that an applicant compare the claimed invention to the closest prior art; and (2) the requirement that an applicant establish that the “difference” occurs for all the inventive species within the claimed genus, i.e., that the evidence of non-obviousness is commensurate in scope with the claims. *See In re De Blauwe*, 736 F.2d 699, 705, 222 USPQ 191, 196 (Fed. Cir. 1984) (“an applicant relying on comparative tests to rebut a prima facie case of obviousness must compare his claimed invention to the closest prior art.”); and *In re Greenfield*, 571 F.2d 1185, 1189, 197 USPQ 227, 230 (CCPA 1978) (quoting *In re Tiffin*, 448 F.2d 791, 792, 171 USPQ 294, 294 (CCPA 1971) (“Establishing that one (or a small number of) species gives

unexpected results is inadequate proof, for ‘it is the view of this court that objective evidence of non-obviousness must be commensurate in scope with the claims which the evidence is offered to support.’’’)).

These are two separate requirements with two related but separate purposes. The “closest prior art” requirement is based upon the principle that a comparison to the closest prior art is likely to provide the most probative comparative data. On the other hand, the “commensurate in scope” requirement serves to reasonably assure that the species encompassed by the claim, and which would reasonably otherwise appear to have been obvious to one of ordinary skill in the art, each provide the unexpected result. The claims must be limited to an applicant’s inventive contribution. *See In re Hotchkin*, 223 F.2d 490, 493, 106 USPQ 267, 270 (CCPA 1955) (“[I]n view of the similarity between that nut and the prior art, the protection accorded should be limited to the specific embodiment which has been shown to produce the results in question. Appellant should not be allowed claims covering materially different structures which have not been shown to have any particular advantages.”).

The question here, we emphasize, is a question of evidence and the burden is on the Appellant to show unexpected results. To reach the ultimate conclusion of obviousness, we set aside the initial conclusion of prima facie obviousness and reevaluate all the evidence anew under the requirements of 35 U.S.C. § 103(a). *In re Johnson*, 747 F.2d 1456, 1460, 223 USPQ 1260, 1263 (Fed. Cir. 1984).

Applying the preceding legal principles to the facts of record in this appeal, we determine that the showing in the Clatty Declaration is

insufficient to rebut the prima facie case when all of the evidence is reviewed as a whole.

First, as found by the Examiner, the evidence is not commensurate in scope with the claims which the evidence is offered to support.

The Clatty Declaration relies upon the showing as follows:

As can be seen from the data presented in TABLE A and Exhibit A, just adding a vegetable-based polyol to a typical polyurethane-forming reaction mixture did not significantly improve the properties of the polyurethane.

It can be seen from the data presented in TABLE B and Exhibit B, that when a vegetable-derived polyol was used as a substitute for a portion of a polyether polyol of the type which is typically used in such formulations, polyurethanes having improved properties were obtained. More specifically, when a soy-based polyol is used in an amount greater than 0 and less than or equal to 30 wt%, polyurethanes characterized by higher Flex Moduli and Heat Distortion Temperatures than (a) the control in which no vegetable oil-derived polyol was used and (b) compositions in which greater than 30 wt% soy-based polyol was used were produced.

(Declaration ¶ 5). Both Table A and Table B report results obtained when using various polyol mixtures in the isocyanate-reactive component. Table B shows results for three inventive examples (Experiments 14-16) in comparison with two comparative examples (Experiments 1 and 17). The inventive examples are limited to mixtures of one specific soybean oil-based polyol (soy A) with blends of two specific petroleum-based polyols (polyols A and B). On the other hand, Kurth discloses other vegetable oils, such as rape seed oil and palm oil can be used, and further indicates that a wide range of petroleum-based polyols were known in the art. In view of the reach of Kurth, Appellant must demonstrate that at least the vegetable oil-

based polyols of the claim in combination with the claimed genus of isocyanate-reactive materials produce the results in question.

With respect to component b) of the claimed mixture, Appellant's test data is limited to a specific mixture of a polyol A (glycerol-started polyether of propylene oxide having a functionality of 3 and molecular weight about 160) and polyol B (glycerol-started polyether of propylene oxide and ethylene oxide with a functionality of 3). The claims, however, are not so limited. Claim 1 encompasses any isocyanate-reactive material different than a) having a functionality of at least 1 and a number average molecular weight of 400-1,000. Claim 7 is limited to polyether polyols of 2-8 functionality and 400-1,000 number average molecular weight, but not to the specific mixture of glycerol-started polyether alkyl oxide polyols tested. Appellant has not explained how the testing of the specific mixtures of polyols A and B are representative of the much larger family of polyols claimed.

With respect to component a), the data is limited to blown soy-based polyols, but claim 1 is more broadly directed to vegetable oils, fish oil or oil derived from animal fat. In Kurth, blown soy-based polyols are described as preferred, but Kurth also discloses that other vegetable oils, such as those relatively high in triglyceride concentration and low in cost (rapeseed or palm oil, for instance) are useful (col. 4, ll. 57-63). Appellant must, therefore, provide evidence of unexpected results at least extending to the vegetable oil genus of Kurth.

The evidence is further not commensurate in scope with claim 7 for an additional reason. Claim 7 encompasses the comparative example 17 in which 38% of the polyol is soy-based. Therefore, Appellant has not shown a



“difference” in result between the compositions encompassed by claim 7 and those of comparative example 17.

Stepping back and taking a broader view of the evidence, there is another more fundamental problem. Appellant is only relying upon the data in Table B as showing a difference in results, yet the claims are not limited to the substitution of polyol B with a soy-based polyol, they encompass adding vegetable-based polyol to a typical polyurethane-forming reaction mixture as done in at least some of the Table A data presented in the Clatty Declaration. Example 5 presented in Table A, for instance, has percentages of polyols within the claimed ranges, but has a HDT and flex modulus well below the comparative examples. Again, the showing is not commensurate in scope with what is claimed.

Finally, we also determine that Appellant has not established that the “difference” is of the nature that one of ordinary skill in the art would find unexpected. In this regard “it is not enough to show that results are obtained which differ from those obtained in the prior art: that difference must be shown to be an *unexpected* difference.” *In re Klosak*, 455 F.2d 1077, 1080, 173 USPQ 14, 16 (CCPA 1972). “Mere improvement in properties does not always suffice to show unexpected results.” *In re Soni*, 54 F.3d 746, 751, 34 USPQ2d 1684, 1688 (Fed. Cir. 1995); *see also In re Longi*, 759 F.2d 887, 897, 225 USPQ 645, 651 (Fed. Cir. 1985)). The result must be different in kind and not merely in degree. *In re Huang*, 100 F.3d 135, 139, 40 USPQ2d 1685, 1689 (Fed. Cir. 1996).

Appellant’s increase in flex modulus is less than 10%. The HDT increase is less than about 12%. In order to properly evaluate whether a superior property was unexpected, it is necessary to consider what properties

were expected. *Pfizer Inc. v. Apotex Inc.*, 480 F.3d 1348, 1371, 82 USPQ2d 1321, 1338 (Fed. Cir. 2007). *Id.* However, on the present record there is insufficient evidence of what range of HDT and flex modulus values one of ordinary skill in the urethane foam art would have expected to obtain. That the values vary somewhat based on changes in concentration between different polyols would have been expected. It is not clear that the increase in HDT and flex modulus shown in Table B for the components within Appellant's claimed range is a "difference in kind" rather than a mere "difference in degree."

Appellant has not met the burden in showing that the claimed isocyanate-reactive components possess unexpectedly good properties in comparison to the compositions of the prior art.

### III. CONCLUSION

We conclude that the Clatty Declaration does not establish that the genus of isocyanate-reactive components encompassed by the claims provide a different result than the formulations disclosed by Kurth, and further we conclude that Appellant has not demonstrated that the results would have been unexpected to those of ordinary skill in the art. The totality of the evidence supports the Examiner's conclusion of obviousness.

### IV. DECISION

The decision of the Examiner is affirmed.

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V. TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal maybe extended under 37 C.F.R. § 1.136(a)(1)(iv).

AFFIRMED

tf/lr

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